

Unique Paper Code (UPC) : 32531327-OC
Name of the Paper : Molecular Biology
Name of the Course : B.Sc. (Hons.) Microbiology
Semester : 3
Duration : 4 hours including time taken for downloading
question paper and uploading answer sheets
Maximum marks : 75

On first page, please write the following details:

1. Date and time of examination (DD/MM/YYYY, Hours:Min)
2. Examination Roll Number
3. Name of the Program, i.e. B.Sc. (H) Microbiology
4. Semester
5. Unique Paper Code (UPC)
6. Title of the Paper
7. Name of the College
8. Email ID of the student
9. Mobile Number of the student

SET 1

Attempt any **four** questions. **All** questions carry equal marks. Supplement your answers with self-explanatory diagrams/flowcharts. Please write your answers on A4 size sheets and put the page number at the top of each page.

Q1. How do different types of DNA vary with respect to their structure? Write a brief comment on organization of DNA in eukaryotes. How do different physical factors such as temperature and ion concentration influence structure of DNA and what is their significance?
6.5+6.5+5.75

Q2. How does the process of DNA replication in eukaryotes differ from that in prokaryotes? Write briefly about the mechanism of rolling circle replication. Explain how telomeric DNA is replicated. Use diagrams where necessary.
6+6+6.75

Q3. How are introns removed from the primary mRNA transcript - explain the mechanism involved with suitable diagrams. How does mRNA processing vary in producing different types of mRNA from same gene?
9+9.75

Q4. Explain the process of translation initiation in prokaryotes? Explain how tRNAs are accurately charged with the specific amino acid. Name any three translation inhibitors and their point of action. 7.5+7.5+3.75

Q5. Elaborate on the regulation of gene expression in the tryptophan operon. How is gene expression regulated at the time of mating type switching in budding yeast OR during sporulation in Bacillus? 10+8.75

Q6. What are the enzymes involved in histone acetylation and how do they regulate gene expression in eukaryotes? How does the sigma factor help in binding of RNA polymerase to the promoter in prokaryotic transcription? Explain with diagrams. 9+9.75